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ABSTRACT

This paper provides an overview of evidence on education in South Africa provided by household survey data, with a particular focus on large national surveys such as the 1993 South African Living Standards Survey and the annual October Household Survey. These surveys indicate that racial gaps in schooling persist in South Africa, although they have declined steadily over time. There is essentially no gender gap in schooling, however, with almost identical schooling outcomes for men and women in all racial groups. The racial gap in schooling can be largely attributed to a high rate of grade repetition for Africans, with only small differences in enrollment rates across racial groups. School quality has an important effect on both grade attainment and adult economic outcomes and is clearly an important component of the racial gap in schooling. Survey data demonstrate a large effect of schooling on earnings beginning in late primary years, with a higher rate of return to schooling for Africans than for whites. (Contains 22 references.) (Author/SM)

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Causes and Consequences of Schooling Outcomes in South Africa: Evidence from Survey Data

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Causes and Consequences of Schooling Outcomes in South Africa: Evidence from Survey Data

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Abstract

This paper provides an overview of evidence on education in South Africa provided by household survey data, with a particular focus on large national surveys such as the 1993 South African Living Standards Survey and the annual October Household Survey. These surveys indicate that racial gaps in schooling persist in South Africa, although they have declined steadily over time. There is essentially no gender gap in schooling, however, with almost identical schooling outcomes for men and women in all racial groups. The racial gap in schooling can be largely attributed to a high rate of grade repetition for Africans, with only small differences in enrollment rates across racial groups. School quality has an important effect on both grade attainment and adult economic outcomes, and is clearly an important component of the racial gap in schooling. Survey data clearly demonstrate a large effect of schooling on earnings beginning in late primary years, with a higher rate of return to schooling for Africans than for whites.

Datasets Used

October Household Survey (OHS): South Africa, 1995

Introduction

Education lies at the foundation of many issues in South Africa today. It is impossible to analyze issues such as racial differences in income, trends in unemployment, or intergenerational transmission of inequality without looking at the role of education. One of the most valuable sources of data on education is household survey data. While large multi-purpose national surveys such as the October Household Survey (OHS) have a number of limitations, they nonetheless can provide rich information about many aspects of education. This paper summarizes a number of important facts about education in South Africa that have been demonstrated by survey data. Much of the discussion focuses on lessons drawn from large national household surveys such as the OHS. We also draw on smaller specialized studies that have been designed to answer specific questions that cannot be readily analyzed with other available surveys. We do not attempt to provide a complete overview of the very extensive literature on education in South Africa. Rather we draw heavily on research that we have been involved in ourselves, including some of our own data collection projects, summarizing key conclusions of that research and pointing out some of the strengths and limitations of household survey data for studying education.

The existence of high quality nationally representative household survey data is a relatively recent phenomenon in South Africa, beginning with the South African Living Standards Survey (SALSS) conducted by the Southern Africa Labour and Development Research Unit (SALDRU) and the World Bank in August-December 1993. This is an integrated household survey with roughly 9,000 households and 40,000 individuals, following the general structure and purposes of the World Bank's well-known Living Standards Measurement Surveys collected in a variety of developing countries (SALDRU, 1994). The survey contains detailed information on educational attainment and school enrollment for all household members, along with data on variables such as earnings, employment, and health. The SALSS, which was collected without formal governmental involvement, was followed by the development of the October Household Survey by Statistics South Africa. Collected annually since 1994, the OHS provides a broad set of information on all household members for a large nationally representative sample. The 1995 OHS, which is used for many of the results discussed in this paper, contains information on about 130,000 individuals residing in 30,000 households. In this paper we will demonstrate a number of valuable uses of large national surveys such as the SALSS and OHS for research on education, at the same time that we point out some of their limitations. We will also draw on some additional data sources that help address some of these limitations, including school-based data such as the Education Atlas and the School Register of Needs (see Case and Deaton 1997, Case and Yogo 1999), along with smaller specialized surveys such as the Guguletu High School Study conducted in 1998 (see Anderson et al. 1999, 2001).

Trends in schooling by race and gender

Large household surveys such as the SALSS and the OHS provide a valuable source of information summarizing the history of schooling attainment in the country. Subject to some assumptions, variations in schooling by age can take the place of historical data on schooling attainment. We need to assume that there has not been significant migration in or out of the

country that differs by education level, and that there are not significant mortality differentials with respect to education across the ages being considered. Differential mortality by education will tend to make the mean education of older age groups appear greater than it would have been using historical data. This will tend be more important for more disadvantaged population groups, possibly causing racial differentials in education to appear smaller at older ages. The effects of differential migration by education are more difficult to predict.

Figure 1 shows mean years of schooling by years of age from the 1995 October Household Survey (OHS) for the four population classifications that were used under apartheid and that continue to be used in most South African surveys – African (black), coloured, white, and Indian.[1] Years of schooling refers to the highest grade completed, and does not necessarily correspond to the actual number of years individuals spent in the school system. The 1995 OHS sample is 70.3% African, 13.5% coloured, 12.5% white, and 3.6% Indian. Not surprisingly, Figure 1 shows a substantial schooling advantage for whites, although the gap has narrowed across more recent cohorts. For the oldest age groups the gap between whites and Africans is almost 8 years, while for younger cohorts it is around 3 years. Schooling for the Indian population has become roughly equal with that of whites. The mean schooling of the African and coloured populations has also converged among recent cohorts.

Given the small size of the Indian and coloured populations in these surveys, for the sake of precision and greater statistical power we will focus on whites and Africans for most of the results presented in this paper. Figure 2 shows trends in three measures of schooling attainment for men and women in the African and white population groups. The top panel shows mean years of schooling, the same measure shown in Figure 1. The second panel shows the proportion that have completed at least grade 7 (standard 5). The bottom panel shows the proportion that have completed grade 12 (standard 10). All three panels show that schooling outcomes of males and females are almost identical. There is virtually no gender gap in schooling among any of the racial groups in South Africa, even among older cohorts (Case and Deaton 1999, Lam 1999, Thomas 1996). These roughly equal schooling outcomes for males and females are in contrast to the situation in a number of other African countries (Lloyd, Kaufman, and Hewett 1999), but are similar to the situation in Brazil and other Latin American countries (Lam 1999).

Although mean schooling has risen at a fairly rapid and steady rate for Africans, Figure 2 shows that there are still large racial gaps in the proportion completing grade 7 and an even larger gap in completion of secondary schooling. While close to 90% of whites in younger cohorts have completed grade 12, the figure is less than 35% for Africans. Pass rates on the matriculation

[1] Some assumptions are required to assign a value for years of schooling. The 1995 OHS collapses Sub A, Sub B and Standard 1 (grades 1-3) into a single category. We assign these individuals 2 years of schooling. Individuals in certificate or degree categories are assigned a number of years of schooling corresponding to the normal number of years required to obtain that certificate or degree.

exam taken at the end of grade 12 are much lower for African students, an important determinant of subsequent opportunities for higher education and employment.

Grade attainment and the role of grade repetition

Figures 1 and 2 document large differences in the schooling attainment of white and African adults. Evidence on the schooling at younger ages is provided in Table 1, which reports data on grade attainment, enrollment, and work activity for 10-24 year olds in the 1995 OHS. While surveys like the OHS are not well equipped for analyzing detailed components of schooling such as school quality, school attendance, or student achievement, these large nationally representative samples are well-suited for looking at recent trends in grade attainment and school enrollment for young people in narrowly defined groups in terms of age, race, gender, and region. The first two columns of Table 1 show how the schooling gap between whites and Africans develops with age beginning at age 10. The schooling advantage of whites is about half a grade at age 11, over one grade at age 14, and about 2.5 grades for 18 year-olds.

While the OHS and similar surveys do not provide direct information on grade repetition, it is possible to use the data to draw indirect inferences about the role of grade repetition in explaining the racial gap in grade attainment. The columns labeled "grades per year" in Table 1 show one useful measure for summarizing progress through school – the number of grades completed per year of age since age 6. For Africans this value is around 0.80 grades per year for ages 10 to 16, while for whites it is around 0.94 grades per year. An alternative measure of grade progress in these data is the change in mean schooling associated with a one-year change in age (for example, from age 12 to age 13 the change is 0.79 for Africans). Using this measure, Case and Deaton (1999) estimate an average advancement rate around 0.6 for Africans age 10-18 in the 1993 SALDRU survey. These measures of grade advancement provide strong evidence that the African disadvantage in schooling is not primarily the result of students dropping out of school early, but is rather driven by a slower rate of grade advancement that begins in early grades.

Further evidence that grade repetition is important is shown in the next two columns of Table 1, which show some surprising patterns in enrollment rates.[2] Although African children are on average over one year behind white children in grade attainment by age 14, the enrollment rates of Africans are 97% or above between ages 10 and 14. The enrollment rates are actually higher for Africans than for whites beginning at age 18, a reflection of the fact that Africans are on average more than two years behind whites in schooling at that age. The evidence on grades per year and enrollment tell a consistent story. It is grade repetition rather than non-enrollment that is primarily responsible for the lower schooling attainment of African children.

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[2] The OHS asks whether individuals are "presently attending school/ college/ university/ technikon, etc." Those attending either full-time or part-time are considered enrolled for the results in Table 1.

The final columns of Table 1 show the percentage at each age working (including those who looked for work last week and who reported any work in the past year).[3] The proportions working are relatively low. Among Africans, only 2% of 15 year-olds and 4% of 16 year-olds report working by these fairly broad definitions. Controlling for family characteristics (not shown), somewhat higher fractions work among those whose mothers have the lowest levels of education, but even among 17 year-olds whose mothers have less than six years of schooling the proportion working is only around 10%. Although Table 1 suggests that the competition between work and school is not a dominant factor in explaining the lower schooling attainment of Africans, the tradeoff between work and school may be more important in the late teen years. Although roughly equal fractions of African and white youths are working beginning at age 17, the white youths are much more likely to have completed secondary schooling by that time. The data indicate that among 17 year-olds, for example, white youths who are working are drawn primarily from the group that has completed grade 12, while only a small fraction of the Africans who are working have completed grade 12.

The results in Table 1 suggest that the schooling gap between whites and Africans does not result primarily from differences in enrollment rates or from higher dropout rates among African teenagers. Grade repetition appears to be a much more important determinant of lower grade attainment for Africans. Unfortunately there is little direct information about grade repetition in surveys such as the OHS. The OHS does not obtain data on grades repeated, interruption of schooling, or other educational information beyond highest grade completed. School records available from the Ministry of Education also provide little direct information on grade repetition. One of the few studies to collect detailed information on grade repetition was the Guguletu High School Study (see Anderson et al. 1999, 2001). Retrospective educational histories collected from 603 students enrolled in an African township high school in Cape Town were used to analyze the educational progress of these students.[4] Table 2 presents results based on students' retrospective schooling histories from this survey. The results are presented in terms of years delayed for grade, based on the assumption that a student who begins school at the appropriate age and experiences no grade repetition will be age 18 during the final (matric) year of secondary school; a student who is age 19 during matric is one year delayed, a 20 year old is two years delayed, etc. Similarly, a student who is 18 during the 11th grade is one year delayed, etc. Table 2 presents the results for each grade up through grade 12 (see Anderson et al. 2001 for further details). In the earlier grades age delay is small and is due almost entirely to the age at

[3] For all household members age 10 and over, the OHS asks what the individual "did most during the last 7 days." Those reporting an activity other than work are also asked if they did "any work for pay, profit, or family gain during the past year?" All are classified as working in Table 1 who reported working or looking for work in the past week or reported working in the past year.

[4] This is a unique and important sample, but we must acknowledge that it draws from a very specific population: children attending low-quality township schools. Two other important groups are missing from the analysis: children who have dropped out of school entirely, and those who choose to attend better quality schools. (Now that the residential restrictions of apartheid are removed, more affluent parents, such as the teachers in the school we worked in, often send their children to school in "formerly white" areas, although they continue to live in the townships.)

which the student began school. By the ninth grade, however, the majority of academic delay is due to grade repetition, rather than non-enrollment or delays in beginning school. Results from this survey indicate that by the end of secondary school, roughly 2/3 of the students have repeated at least one grade, and more than 1/3 have repeated at leāst two grades (not shown in Table 2). These results are consistent with those obtained from national datasets, and provide further evidence that grade repetition is the driving factor behind the educational gap between races in South Africa.

Grade repetition is potentially a self-reinforcing process. The evidence relating grade repetition to subsequent academic performance in South Africa is necessarily indirect, but a plausible argument can be made that children who have failed in the past will fare less well in school. Using data from the Guguletu High School Study, Anderson et al. (2001) find a strong relationship between age and matric exam scores. Each additional year of age results in a decrease of between one-half to two percentage points on standardized matric exams. This effect may sound small, but is actually quite large when one considers that the average matric scores in this school were less than 30% for most subjects, and that students ranged in age from 17 to 30. For many subjects, students who were age 18 in grade 12 (zero years behind) scored a full ten percentage points higher than students in their mid-twenties or older. For some subjects, such as mathematics and biology, this represents a halving of scores for students who have repeated several years.

Grade repetition may also influence subsequent academic performance through its effect on school expenditures and school quality. There is strong reason to believe that school fees are correlated with school quality in South Africa. Anderson (2000), using financial expenditures on schooling for African children reported in the 1995 OHS, finds that children who are behind for their grade have less money spent on their school fees, their transportation to school, and on other school expenses. These results are summarized in Figure 3. The cross-sectional nature of the dataset does not allow us to disentangle whether students who have attended better (more expensive) schools throughout their lives fail less, whether families are choosing to send children who have failed previously (and are likely to fail again) to lower quality schools, or both. Nonetheless it is interesting to observe the association between school quality and the speed with which children advance through school. Students who are behind six or more years for their grade have approximately half as much money spent on their schooling as children who are on track or are slightly ahead for their age (Figure 3). This result persists in multivariate analyses controlling for such factors as the student's age, gender, family structure, location, and household socioeconomic characteristics (Anderson 2000).

The effects of family background on schooling outcomes

Another valuable feature of large household surveys such as the October Household Survey is the ability to look closely at the relationship between parental characteristics and the schooling attainment of children. Figure 4 shows the mean schooling of 13-year-old and 17-year-old Africans and whites by the years of schooling completed by the (co-resident) mother using the 1995 OHS. No estimates are shown for white mothers below 8 years of schooling due to the

small number of observations in these groups. Not surprisingly, Figure 4 shows a strong positive relationship between the schooling of mothers and the schooling of their children. The schooling advantage of African children whose mothers have 12 years of schooling compared to those whose mothers have less than 4 years of schooling is roughly two full grades for both 13 and 17 year-olds. Including controls for province and rural-urban residence in regressions lowers these effects only slightly (Lam 1999). Including both father's schooling and mother's schooling in the same regression, the results indicate roughly equal effects of mother's and father's schooling, with the pattern shown in Figure 4 picking up a combined effect of both parents (Lam 1999). There is virtually no difference in schooling outcomes of boys and girls, and no apparent evidence of the differential impact of mother's and father's schooling found in other countries.

Case and Deaton (1999) find similar effects of parents' schooling on child youth outcomes using the 1993 SALSS. It should be noted that these results in Figure 4 are based on samples of children who live with their mothers. None of the major South African data sets provide information on children's non-resident parents, thereby excluding an important fraction of students (Anderson 2000).[5] The Guguletu High School Study contains information on non-residential parents, and not surprisingly Anderson et al. (1999) find differential time and monetary investments in children by resident and non-resident fathers. National level data on the education and involvement of non-resident parents would be greatly desirable.

While higher parental schooling is associated with higher schooling attainment for children, it is not clear what causal mechanisms drive this relationship. One possibility is in a sense the most literal interpretation of the relationship, namely that the education of parents enters directly into a schooling production function for children, working through the human capital children acquire in their home environment and through factors such as parents' ability to help children with their homework. More indirect mechanisms may also be at work, however. The most obvious example is that better educated parents may simply live in neighborhoods with better schools (or choose to send their children to better schools in other neighborhoods), perhaps as a deliberate strategy to improve opportunities for their children. Evidence that this may be an important issue is provided by the Guguletu High School Study, where the relationship between parents' schooling and children's schooling among the 603 students surveyed in this one low-quality school is weak, in spite of considerable variation in parent's schooling (Anderson et al. 2001).

In addition to the effects of parents' education and income, family structure may be an important determinant of youth outcomes (Anderson 2000, Cherian 1989, Cherian 1994, Fuller and Liang 1999). Young people live in a wide variety of family arrangements in South Africa. According to the 1993 SALSS, the proportion of non-whites that lived with both parents was only 55% at age 12 and 50% at age 17, compared to 90% and 78% for whites at the same

[5] If less educated parents are more likely to live apart from their children, regressions of parental education on children's schooling will overestimate the effect of parental schooling.

respective ages. Roughly 25% of non-whites lived only with their mother, and over 15% of 12-year-old non-whites lived with neither parent. Many of these live in "skip generation" households, with grandparents co-residing with grandchildren without either parent present (Case and Deaton 1998). In an analysis of schooling outcomes among African children ages 10 to 24 in the 1995 OHS, Anderson (2000) shows that family structure is correlated with schooling outcomes. Some of these patterns are shown in Table 3. Relative to children living with both of their genetic parents, children living in all other family situations are less likely to be enrolled in school and are further delayed in school if enrolled. Children living with neither genetic parent (a full 25% of the sample) have also completed fewer grades, regardless of their enrollment status. These patterns are confirmed in multivariate analysis (Anderson 2000). Children living with both genetic parents experience the best schooling outcomes, those living with neither parent experience the worst, while children living with a single mother experience intermediate outcomes (although the disadvantage of living with a single mother appears to be smaller than would be expected based on U.S. experience). The cross-sectional and within-household nature of the existing datasets means we cannot factor in children's residential histories with their parents, nor can we include non-residential parents' education level, employment, current marital status, etc.

One third of African children live with a grandparent or an older adult receiving a state old-age pension. Women over age 60 and men over age 65 who are not receiving a private pension are eligible for a generous state pension, which is more than twice the median monthly income of Africans in 2000. (See Case and Wilson 2001, and Case and Deaton 1998 for details on the pension system). The pension plays an important role in the economics of African households, and was frequently mentioned by students in the Guguletu High School Study as a source of money for school fees, uniforms, and other large expenses. A limitation of existing data is that the characteristics of grandparents are observable only in the case of co-residence, requiring researchers to analyze the presumably non-random subset of multi-generation households. The potential availability of pension income is an important source of variation in resources available to young people (see Case 2001, Duflo 2000, Bertrand et al. 2000.)

The role of school quality

One of the important limitations of surveys such as the OHS is lack of information on the quality of schools children attend. Variation in school quality is an extremely important dimension of schooling inequality in South Africa, and clearly plays a central role in understanding racial differences in schooling outcomes (see Fedderke at al. 1998 for a discussion of historical differences in school quality across racial groups). As noted above, simple controls for province and rural-urban location only slightly weaken the relationship between parents' education and children's education. Controls at such a high level of geography are unlikely to capture effects working at the level of neighborhoods, however, so such evidence by no means indicates that there is a direct productivity effect of parents' education.

Evidence on the direct contribution of school quality to school outcomes is provided by Case and Deaton (1999), who combine the 1993 SALSS with data on local school quality from

the Education Atlas of South Africa.[6] Their empirical analysis shows large effects of school quality, as measured by pupil-teacher ratios, on outcomes for African children. Controlling for household background variables—which themselves have powerful effects on outcomes, but have no effect on pupil-teacher ratios—they find strong and statistically significant effects of pupil-teacher ratios on enrollment, on educational achievement, and on test scores for numeracy. The striking result found by Case and Deaton – that variables such as the mean schooling of parents in a community are uncorrelated with pupil-teacher ratios – provides confirmation for the view that African families in the past had little control over the quality of the schools in their communities. This suggests that school quality in the past tended to be more independent of family characteristics than would be the case in the United States, and means that more can be learned from looking at the relationship between school quality and later outcomes.

Evidence on the effect of school quality on adult earnings is provided by Case and Yogo (1999), who find that the quality of schools in a respondent's magisterial district of origin has a large and significant effect on the rate of return to schooling for African men. Case and Yogo estimate the impact of school quality using the 1996 South African census (10 percent public release sample). The census provides information on individuals' incomes and educations, together with information on the magisterial district in which individuals currently live, in which they are currently employed, and whether they were born elsewhere. For those who have migrated to their current residence, the census asks from which magisterial district they have come. Case and Yogo analyzed earnings data for 24 to 34 year olds, assigning to these young adults the 1991 school quality measures in the magisterial districts in which they were raised. (For those who have never moved, this is information on school quality in 1991 in their current magisterial district of residence. For movers, it is that from the magisterial district they report having come from.) The data available from the census allow estimation of the extent to which school quality affects individuals' returns to education, while holding constant differences in earnings attributable to differences in the levels of earnings both in the districts in which they were raised, and in the districts in which they are currently employed. The impact of school quality on these young adults is estimated, again, under the assumption that African families in the past had little control over the quality of the schools in their communities and, for this reason, the impact of school quality on labor market outcomes may be measured without concern that parents who cared more about their children's educations used exit or voice to change the quality of schools their children attended.

Case and Yogo find that for African men aged 24 to 34 a decrease in the pupil/teacher ratio of 5 students is on average associated with an increase in the return to education of roughly 1 percent. A reduction in the pupil/teacher ratio of 10 would result in an increase in earnings of 8 percent for a person obtaining 4 years of schooling (standard 2). To put these numbers in perspective, it is useful to note that these estimates are about twice as large as those estimated by Card and Krueger (1992) for U.S. schools for cohorts born between 1920 and 1950 using a

[6] This is a measure of average school quality for the district in which individuals grew up, not necessarily the quality of the specific school they attended.

similar estimation technique. Case and Yogo find that pupil/teacher ratios are a powerful predictor of returns to education for African men, and that adding information on the quality of teachers' educations, the adequacy of textbooks, and the education of the respondents' parents (or, at least, people in the parents' generation) has little effect on the estimated impact of changes in pupil/teacher ratios.

For at least two reasons, the impact of school quality on returns to education understates the full impact of school quality on earnings in South Africa. School quality has been shown to have a large, positive and significant effect on years of completed education (Case and Deaton 1999). In addition, school quality affects the probability of employment for both men and women. Case and Yogo find a negative and significant effect of pupil/teacher ratio on years of completed schooling for men and women in each age cohort. Estimating a linear relationship between pupil/teacher ratios and years of completed schooling, Case and Yogo find that reducing the pupil/teacher ratio by 10 students would, all else equal, increase completed schooling by 0.6 years. This result is also identical to that estimated by Case and Deaton, using the 1993 South African Living Standards Survey. In addition, for men, they find a small negative effect of pupil/teacher ratios on the probability of employment. For women, they find a much larger effect of school quality on the probability of employment at each age. They estimate that an increase in the pupil/teacher ratio of 10 students per class reduces the probability of employment by roughly five percent, with the effect slightly larger at older ages.

In the post-apartheid era, non-whites have greater choice over the schools their children may attend. This may lead to increased variance in schooling outcomes within racial groups. As more motivated or financially secure families are able to send their children to better quality schools, the traditional township schools will be filled with the children of less motivated and/or financially able families. Unfortunately, there is no way to measure this with currently available household surveys, since direct information on school quality or measures of children's progress and/or ability are not available. Measuring this information with future data collection projects would undoubtedly prove very useful.

The effects of schooling on employment and earnings

One of the reasons schooling is such an important focus of attention is because of its potential importance as a determinant of adult economic outcomes. Household surveys such as the SALSS and the OHS are an important source of information on these links between education and outcomes such as employment and income. The evidence from South African surveys leads to several important conclusions that are confirmed by a number of researchers. Some of these results are summarized in Table 4, which shows the relationship between earnings and schooling for 30 to 49 year old males in the 1995 OHS. This group is used because it is a segment of the population that would ordinarily have very high rates of labor force attachment.[7]

[7] Earnings in this table include both earnings of employees and net self-employment earnings.

The first pattern that can be seen in Table 4, which comes as no surprise, is the large earnings gap between Africans and whites, even for men with the same level of schooling. For those who completed grade 12, a schooling level at which there are substantial numbers of both whites and Africans, whites have four times higher mean earnings than Africans. As can be seen in the table, part of this gap results from the fact that Africans are over five times as likely as whites to have reported zero earnings during the previous month, an extremely high rate of unemployment for this group of men that would ordinarily be considered in the prime working ages.

The second point demonstrated in Table 4 is that there is a substantial effect of schooling on earnings in both racial groups, especially above five years of schooling. The mean earnings of African men with university degrees are 7.5 times greater than earnings of African men with no schooling. There are very few white men in the low schooling categories, making it impossible to get meaningful estimates of mean earnings in these cells. Returns to schooling appear to be very low for Africans (and are impossible to estimate for whites) through grade 5 (standard 3) in South Africa. Above grade 5, however, there are significant returns to schooling for both whites and Africans.

An important question in understanding the behavior of young people deciding how long to stay in school is what the returns to schooling are in the late high school years. Looking at the returns to completing grade 12, Table 4 shows that Africans completing grade 12 have 2.1 times the earnings of those with grade 8, and 1.4 times the earnings of those with grade 10. Africans with a diploma earn 3.4 times more than those with grade 8 and 2.7 times more than those with grade 10. Similar results are found using wage regressions with flexible parameterizations of schooling and controls for other variables such as province and rural-urban residence, implying returns of 15% to 20% per completed year of schooling at most schooling levels above grade 7 (Lam 1999). These results are similar to estimates from other studies of South African labor markets. Moll (1996) documents the low returns to early years of schooling in South Africa, although the results in Table 4 suggest substantially higher returns to later years of primary schooling than Moll found using surveys up through the 1991 census. Case and Deaton (1999) and Mwabu and Schultz (2000) find similar results with flexible wage regressions using the 1993 SALSS. Both point out that the wage-schooling gradient for Africans has a steeper slope than that for whites in the range for secondary education and above where the two distributions overlap.

An important caveat to these apparently very high returns to schooling is that the average time required to gain one grade of schooling for African students is more than one year. As noted above, indirect evidence on grade repetition suggests that African students advance about 0.6 to 0.8 years of schooling per year of enrollment. Even if the coefficients from a wage equation give the correct estimate of the returns faced by a random 10th grader from *completing* the 11th grade, this may not represent the correct returns to *attending* the 11th grade if the probability of passing is only 80%. As a rough approximation the returns should be discounted by 80%, bringing them somewhat closer to returns to schooling observed in other countries. Even if discounted by as

much as 60%, however, it is important to emphasize that the returns to schooling are quite high beginning with the 5th grade, with returns apparently higher for Africans than for whites.

Since the mean earnings data in Table 4 include men with zero earnings, the earnings-schooling gradient includes the effect of schooling on employment. The last two columns show the percentage of men reporting zero earnings in the previous month, one broad indicator of unemployment. The percentages of African men in these prime earning ages who report zero earnings are extremely high. Over 25% of African men age 30-39 report zero earnings, with levels over 30% at every level of schooling up through 8th grade. The fact that returns to schooling may change significantly when zero earners are included emphasizes the importance of discriminating between the role that education plays in participation behavior, in turning participation into employment, and then in determining the quality of employment. Bhorat and Leibbrandt (1999) show that primary and secondary education is particularly important in encouraging labor market participation by African males, but that tertiary education is key in ensuring employment for those that choose to participate.

South Africa has one of the highest levels of income inequality in the world, a fact that is directly related to the patterns shown in Table 4. As shown in Lam (1999), South Africa's extreme income inequality can be attributed to the combination of a wide dispersion in schooling and high returns to schooling. The higher returns to schooling for Africans may result from a combination of historically limited schooling opportunities and increasing economic opportunities from the end of apartheid. Moll (2000) provides evidence that the between-race component of income inequality has been declining in South Africa while the within-race component has been increasing.

Summary and Conclusions

The empirical evidence from household survey data reviewed in this paper demonstrates a number of important characteristics of the educational experience in South Africa. Racial differences in educational attainment persist, although they have decreased steadily over time. Schooling attainment is almost identical for males and females in all racial groups, a significant difference from the situation in many other African countries. Enrollment rates in primary and secondary school are high for Africans, exceeding 97% through age 14 and surpassing enrollment rates of whites beginning at age 18. Grade repetition rates are also high, however, with Africans advancing through school at no more than eight-tenths of a grade per year of age. The data indicate that grade repetition rather than non-enrollment appears to be responsible for much of the educational gap between racial groups in South Africa.

Families play undeniably important roles in educational outcomes for children, although the cross-sectional and within-household nature of most survey data makes disentangling this relationship problematic. Among children living with their mothers, maternal education has an important and positive impact on how much schooling a child has completed by a given age (and thus, by inference, how often the child repeats a grade). Children who live with neither parent—

an important fraction of African household structures – are disadvantaged in terms of educational outcomes, although pension benefits paid to resident grandparents may help offset this.

School quality plays an important role in the human capital acquisition and educational progress of children in South Africa, although this is difficult to measure directly. Adults who were raised in districts with better schools have better educational outcomes. School quality may be an intermediary variable between family structure and parental investment and schooling outcomes; the most motivated parents may send their children to the best schools. As schooling options increase in South Africa, variance in children's schooling attainment may also grow larger rather than smaller.

Household survey data also provide strong evidence that both the quantity and quality of schooling have strong effects on adult economic outcomes. The evidence on school quality indicates that individuals who grew up in areas with higher pupil/teacher ratios experiencing both lower unemployment and higher earnings as adults, even after controlling for the number of grades completed. Evidence on the effect of additional years of schooling indicate strong effects of schooling on employment and earnings, especially at higher levels of schooling. One additional year of schooling is associated with increases in earnings of around 20-25% above grade 7, with higher rates of return for Africans than for whites.

While much has been learned about education in South Africa using existing household surveys, the work summarized here suggests several factors that could be addressed in future data collection. First, the evidence on the importance of grade repetition suggests that surveys should do a better job of collecting data on the number of years individuals attend school in addition to data on highest grade completed. It would be very valuable to learn the age at which individuals completed their schooling as well. No currently available national surveys contain direct information about the age at which children began formal education, nor how many times they repeated grades or did not enroll in school. For students who are not currently enrolled, it would be useful to know how much time has elapsed since their last enrollment. Data on actual school attendance in addition to school enrollment would also be desirable, as would measures of school performance.

All research on education in South Africa would benefit from the collection of longitudinal data. A partial substitute for longitudinal data would be detailed retrospective schooling histories. Better educational histories (including the age of entry into school, how many grades were failed and repeated, and how many years of non-enrollment occurred) are necessary to fully understand educational dynamics in South Africa. Additionally, existing surveys provide almost no information about non-resident parents, making it difficult to fully investigate the important intergenerational components of schooling. Finally, richer data on school quality that could be linked directly to individuals in household surveys would be very useful for increasing our understanding of the effects of school quality on schooling outcomes, labor force participation, and adult earnings in South Africa.

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Figure 1. Mean Schooling by Age and Race, 1995 South Africa OHS

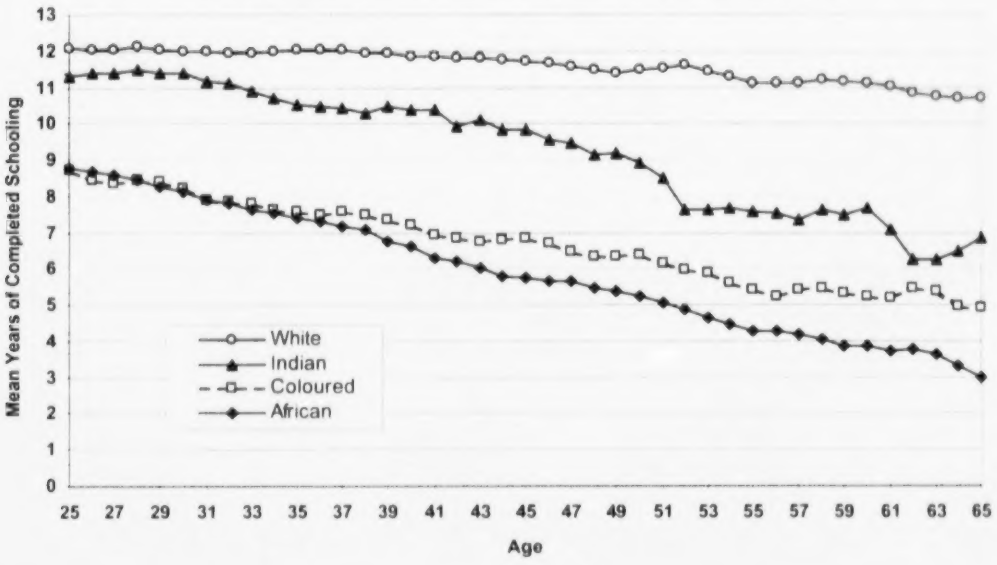

Figure 2. Schooling by age, race, and gender, 1995 South Africa October Household Survey (3-year moving averages)

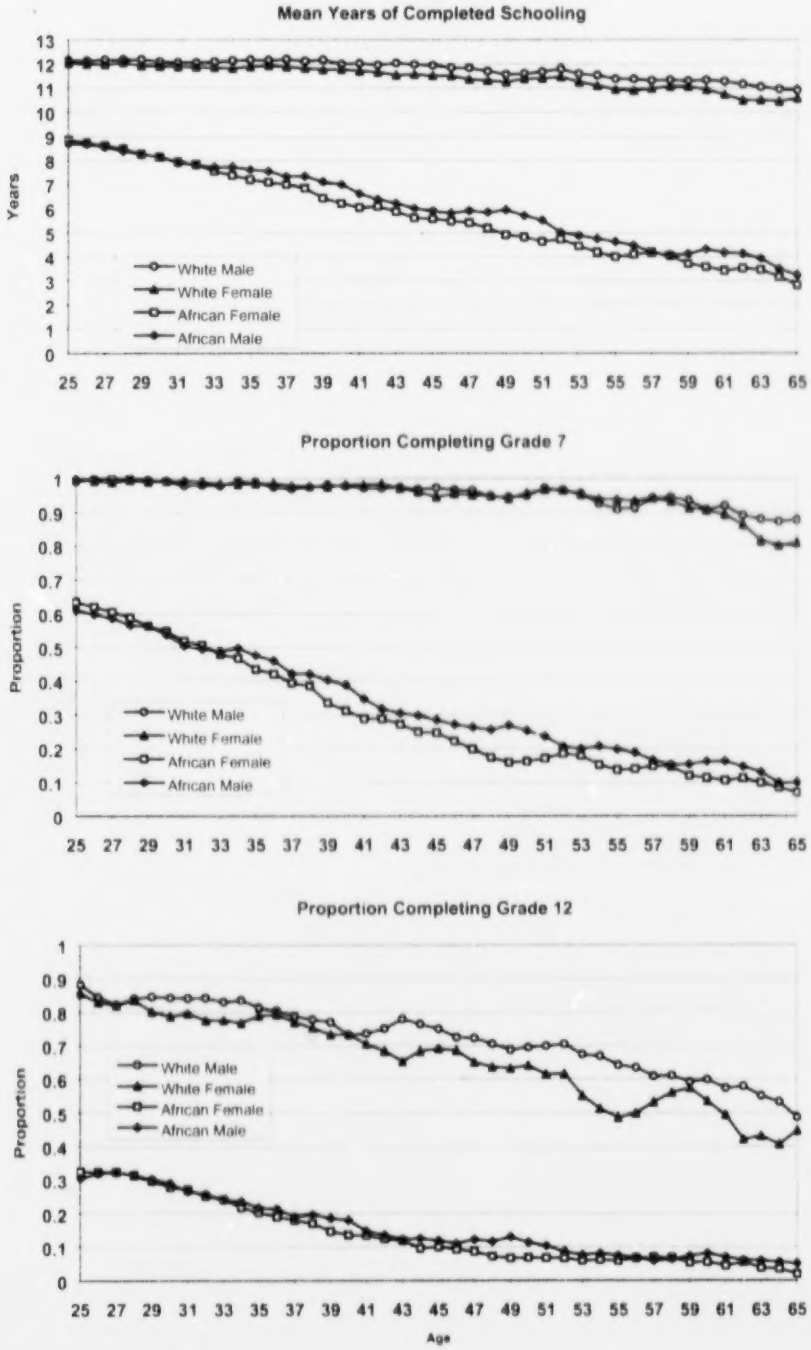

Figure 3. School expenditures on enrolled African students by years delayed in school, 1995 South Africa OHS

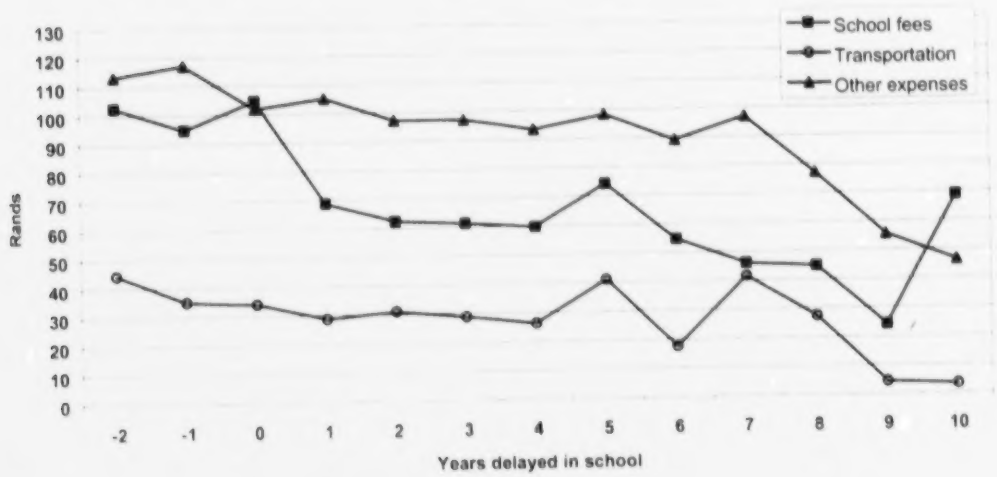

Figure 4. Child's schooling by mother's schooling, 1995 South Africa OHS

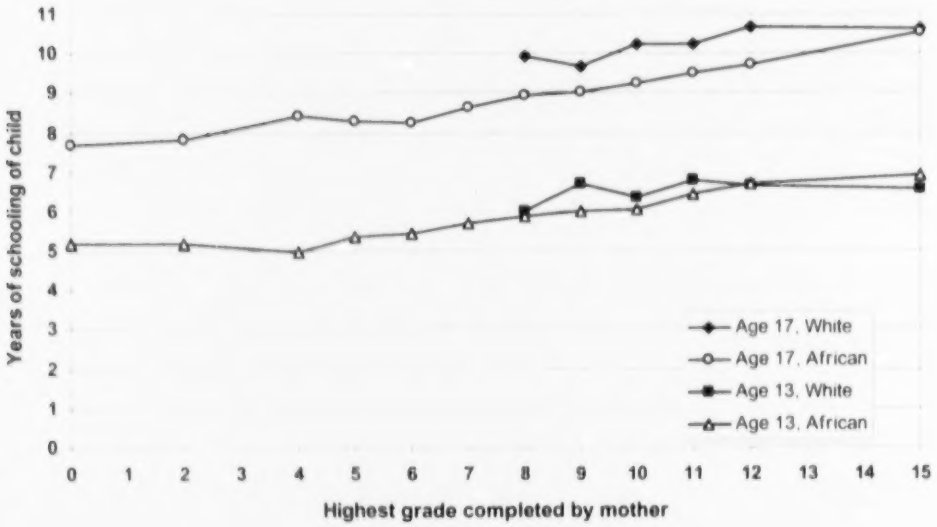

Table 1. Years of schooling, Enrollment, and Work, Ages 10-24, South Africa 1995 OHS

Age	Mean Schooling		Grades per year		Percent Enrolled		Percent working	
	African	*White*	*African*	*White*	*African*	*White*	*African*	*White*
10	3.25	3.44	0.81	0.86	97.1	99.7	0.5	0.0
11	4.04	4.58	0.81	0.92	98.6	99.6	0.2	0.0
12	4.79	5.66	0.80	0.94	98.1	99.7	0.4	0.0
13	5.58	6.50	0.80	0.93	97.7	99.4	0.7	0.3
14	6.35	7.55	0.79	0.94	97.0	100	0.9	0.0
15	7.06	8.55	0.78	0.95	94.8	97.9	2.2	0.0
16	7.86	9.53	0.79	0.95	92.3	96.6	3.8	1.7
17	8.39	10.37	0.76	0.94	89.0	91	6.0	5.4
18	8.72	11.17	0.73	0.93	81.2	79.9	11.0	10.4
19	9.04	11.37	0.70	0.87	75.1	45.3	16.8	37.1
20	9.28	11.49	0.66	0.82	63.8	32.6	27.3	57.9
21	9.26	11.71	0.62	0.78	54.4	34.8	34.5	57.5
22	9.24	11.80	0.58	0.74	46.8	16.4	43.0	69.4
23	9.23	11.84	0.54	0.7	36.4	13.3	51.7	75.9
24	9.15	12.04	0.51	0.67	29.2	9.7	59.3	79.0
Mean	7.23	8.69	0.72	0.88	79.5	74.5	14.9	23.2
N	31,672	3,564						

Table 2. Years delayed by grade for students enrolled in a Guguletu secondary school

Grade	Years delayed	Average number of years			Percent of years delayed		
		Age started school	Years repeated	Years not enrolled	Age started school	Years repeated	Years not enrolled
1	0.67	0.67	0.00	0.00	100.0	0.0	0.0
2	0.99	0.73	0.24	0.02	73.7	24.2	2.0
3	1.14	0.74	0.34	0.06	64.9	29.8	5.3
4	1.24	0.73	0.43	0.08	58.9	34.7	6.5
5	1.36	0.73	0.51	0.12	53.7	37.5	8.8
6	1.53	0.73	0.66	0.14	47.7	43.1	9.2
7	1.64	0.72	0.74	0.18	43.9	45.1	11.0
8	1.75	0.72	0.83	0.20	41.1	47.4	11.4
9	1.97	0.67	1.02	0.28	34.0	51.8	14.2
10	2.20	0.71	1.18	0.31	32.3	53.6	14.1
11	2.47	0.70	1.39	0.38	28.3	56.3	15.4
12	3.00	0.63	1.90	0.47	21.0	63.3	15.7

Table 3. Means (standard errors) of educational outcomes by type of family for African children, 1995 OHS

	Both parents	Single mother	Mother & stepfather	Single father	Father & stepmother	Neither parent	F [p]
Currently enrolled	0.874 (0.005)	0.841 ** (0.007)	0.869 (0.009)	0.800 ** (0.022)	0.743 ** (0.036)	0.713 ** (0.012)	160.6 [0.000]
Highest grade completed	6.79 (0.06)	6.73 (0.07)	6.65 (0.08)	6.95 (0.15)	6.87 (0.22)	6.56 ** (0.07)	5.5 [0.000]
Years delayed in school (if enrolled)	0.94 (0.04)	1.06 * (0.05)	1.14 ** (0.07)	1.36 ** (0.15)	1.38 * (0.25)	1.30 ** (0.54)	16.6 [0.000]
N	11,964	5,652	2,863	470	303	6,963	

Results of Bonferroni two-tailed multiple comparison tests (relative to children living with both genetic parents)
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 4. Earnings by Years of Schooling, Males 30-49, South Africa 1995 OHS

Schooling	Pct. in schooling group		Mean Earnings		Pct. with zero earnings	
	African	*White*	*African*	*White*	*African*	*White*
None	14.0	0.3	1.00	--	31.5	--
Grades 1-3	5.6	0.0	0.85	--	32.6	--
Grade 4	6.6	0.1	0.98	--	32.4	--
Grade 5	6.1	0.1	1.00	--	32.6	--
Grade 6	7.7	0.1	1.20	--	32.7	--
Grade 7	9.4	0.1	1.21	--	31.9	--
Grade 8	11.2	2.2	1.53	3.73	30.5	27.5
Grade 9	6.6	1.5	1.73	12.56	28.1	2.9
Grade 10	9.9	14.4	2.27	7.67	26.7	7.4
Grade 11	5.3	4.0	3.07	9.33	31.3	6.4
Grade 12 (matric)	11.0	40.1	3.27	13.22	21.4	3.6
Grd. 12 + diploma	4.8	18.1	5.19	16.27	6.9	1.7
University	1.8	17.5	7.53	21.43	5.5	2.7
Total	100.0	100.0	1.95	14.02	26.5	4.6
N	8,958	2,329				

Note: Earnings are mean monthly earnings relative to Africans with no schooling. Results omitted for cells with N<30.

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